

**CLAIMS**

WE CLAIM:

1. A medication dispensing apparatus comprising:

5 a housing;

a drive member rotatably fixed during dose preparing and injecting and axially movable in a distal direction relative to said housing, said drive member including a threaded shaft;

10 a fluid container defining a medicine-filled reservoir with a movable piston at one end and an outlet at the other end, said piston engagable by said drive member to be advanced toward said outlet when said drive member is moved distally;

a nut screwable along said drive member threaded shaft;

a screw element threadedly engaged with said housing to be screwable relative to said housing;

15 a nut rotating element connected with said nut to be axially movable and rotatably fixed relative thereto, said nut rotating element rotatably fixed with said screw element when said nut rotating element and said screw element are in a first axial arrangement, said nut rotating element rotatable relative to said screw element when said nut rotating element and said screw element are in a second axial arrangement;

20 a nut advancing plunger threadedly engaged with said screw element, said plunger axially movable and rotatably fixed relative to said housing;

wherein during dose preparing, said nut rotating element and said screw element are in said first axial arrangement, whereby a screwing motion of said nut rotating element and screw element relative to said housing screws said nut rotating element and

said screw element a first axial distance from a home position, which screwing motion of said nut rotating element screws said nut along said drive member threaded shaft a second axial distance different than said first axial distance; and

wherein during dose dispensing, said nut rotating element and said screw element  
5 are in said second axial arrangement, whereby a screwing motion of said screw element relative to said housing back toward said home position advances said plunger in said distal direction to axially advance said nut and thereby said drive member and said fluid container piston to dispense medicine from said outlet.

10           2.       The medication dispensing apparatus of claim 1 wherein said nut rotating element comprises a sleeve portion within said screw element and a manually engageable button portion external to said screw element, said sleeve portion and button portion axially and rotatably shiftable as a unit.

15           3.       The medication dispensing apparatus of claim 2 wherein said button portion is manually plunged during dose dispensing.

4.       The medication dispensing apparatus of claim 3 wherein said button portion is manually rotated during dose preparing.

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5.       The medication dispensing apparatus of claim 2 wherein said button portion comprises a depending lip positioned radially outward of and axially extending distally of a proximal end of said screw element.

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6. The medication dispensing apparatus of claim 2 further comprising means for biasing said nut rotating element and said screw element from said second axial arrangement toward said first axial arrangement.

5 7. The medication dispensing apparatus of claim 6 wherein said screw element and said nut rotating element comprise interfitting teeth that disengage when said biasing means are overcome to shift said nut rotating element and screw element from said first axial arrangement to said second axial arrangement.

10 8. The medication dispensing apparatus of claim 6 wherein said screw element comprises said biasing means that directly engage an underside of said button portion to force said button proximally relative to said screw element.

15 9. The medication dispensing apparatus of claim 1 wherein said screw element comprises a tubular member having a radially inner surface and a radially outer surface, wherein said outer surface is threaded to said housing, and wherein said inner surface is threaded to said plunger.

20 10. The medication dispensing apparatus of claim 1 wherein said nut comprises an extension having an axially extending keyway in an external surface, and wherein said nut rotating element comprises a key that slides within said keyway.

11. The medication dispensing apparatus of claim 1 wherein said nut and said nut rotating element comprise interfitting fingers that share an annular space.

12. The medication dispensing apparatus of claim 1 wherein said nut and said nut advancing plunger comprise cooperating clicker elements for creating audible indications during dose preparing.

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13. The medication dispensing apparatus of claim 1 wherein the threading of said screw element to said housing is of a first lead, the threading of said plunger to said screw element is of a second lead, and the threading of said drive member threaded shaft is of a third lead, and said first lead, said second lead and said third lead are each a  
10 different value.

14. The medication dispensing apparatus of claim 13 wherein said first lead equals a factor M times the third lead, and wherein said second lead equals a factor (M-1) times the third lead.

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15. The medication dispensing apparatus of claim 1 wherein said nut advancing plunger is axially movable and rotatably fixed relative to said housing by at least one prong of said plunger that slidably fits within at least one opening formed in said housing.

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16. The medication dispensing apparatus of claim 1 wherein said nut advancing plunger is axially movable and rotatably fixed relative to said housing by at least one tab of said housing that slidably fits within at least one slot formed in said plunger.

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17. The medication dispensing apparatus of claim 1 wherein said nut advancing plunger includes at least one flange that directly frictionally engages at least one flange of said nut during dose dispensing to resist nut rotation.

5 18. The medication dispensing apparatus of claim 9 wherein said screw element serves as a dial and comprises dose indication markings on said radially outer surface.

10 19. The medication dispensing apparatus of claim 1 wherein insulin is the medicine within the reservoir.

20. The medication dispensing apparatus of claim 1 further comprising a plurality of teeth on said nut advancing plunger that are engageable with at least one tooth on a portion of said nut rotating element to limit apparatus misuse.

15 21. The medication dispensing apparatus of claim 1 further comprising clicking means for identifying a dose setting, said clicking means including two sets of longitudinally extending ribs radially projecting from said nut, each set spanning 90° of the nut circumference and centered 180° apart from the other set, said clicking means 20 further including four axially-extending, resilient toothed fingers of said plunger, said toothed fingers centered at 90° intervals around the circumference of said plunger.

22. The medication dispensing apparatus of claim 1 further comprising means for indicating an end of injection, said indicating means including a resilient arm with a

toothed end which projects from and is integrally formed with a proximal face of a bulkhead separately formed and rotatably fixed to said housing, said indicating means further including a detent on an annular, distal face of said screw element which said toothed end of said arm snaps over when said screw element is fully screwed distally into  
5 said housing during injecting, and wherein a portion of said bulkhead is abutted by and thereby forms a hard stop for said screw element when said screw element is fully screwed distally into said housing.